

## PATENT SPECIFICATION



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177,942

Complete Left: Nov. 11, 1921.

(Patent of Addition to No. 13,448: June 10, 1913.)

Complete Accepted : Apr. 13, 1922.

## PROVISIONAL SPECIFICATION.

## Improvements in or relating to Suspension Devices for Motor and other Vehicles.

I, ANTOINE MUTTI, of Portsmouth Road, Cobham, in the County of Surrey, a citizen of the Republic of Switzerland, do hereby declare the nature of this invention to be as follows:—

This invention relates to suspension devices for motor and other vehicles of the kind in which the wheels are connected with the chassis or body of the vehicle through the medium of pivoted members or devices which are adapted to act upon suitably disposed springs or other resilient devices, the arrangement being such that the action of the resilient devices is magnified whilst means are provided for altering the leverage at which the said devices act. More specifically the invention comprises an improvement in or modification of the invention set forth in the Specification of my prior Patent No. 13,448/1913.

In my said prior specification means are described whereby the alteration of leverage may be obtained automatically in accordance with variations in the load, the said automatic adjustment becoming effective as a result of the passage of the vehicle over inequalities in the road surface.

It is the object of the present invention to provide means whereby the adjustment may be obtained automatically upon variation of the load without relying upon inequalities in the road for bringing the leverage adjusting mechanism into action.

With this object in view in accordance with the invention I provide means whereby the rotation of the running wheels of the vehicle is utilised to bring

into action the leverage adjusting mechanism upon variation in the load.

For the sake of convenience the invention will be described in its application to the constructional form of the apparatus described with reference to Figure 6 of my prior specification above referred to although it will be understood that I do not desire to limit myself to this application of the invention as the principle is applicable to the other constructional forms described in the said prior specification.

The tension controlling lever which is pivoted at one end to the body of the vehicle is at the other end pivoted to a pillar or standard supported by a road wheel axle and the said lever at the end adjacent the said pillar carries a plate having two cam slots formed therein. In one of the said cam slots is engaged the axle of a small freely rotatable wheel (which preferably is rubber tyred) the periphery of which is adjacent to but not normally in contact with the hub of the road wheel or with the brake drum thereof the arrangement being such that upon variation in the load the movement of the lever about its pivot will cause angular movement of the aforesaid plate and bring the periphery of the said rubber tyred wheel into contact with the hub. In the second of the aforesaid cam slots is engaged the fulcrum of a bell crank lever one arm of which is connected with a collar mounted upon a shaft carrying a disc at either end, said bell crank lever serving to bring one or other of the said discs into contact with the said rubber tyred wheel. One end of this

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shaft is connected by a flexible shaft to worm gearing associated with the slidable sleeve mounted upon the tension adjusting lever as described in the prior specification. According therefore to an increase or decrease in the load one or other of the said discs will be brought into contact with the rubber tyred wheel and rotated, this resulting in a movement of the said adjustable sleeve to vary the leverage.

The other end of the said disc-carrying shaft is connected through the medium of a flexible shaft with worm gearing associated with a nut mounted upon a screw which is slidable within a tube pivoted to the vehicle body one end of said screw being connected with a yoke carrying a pin constituting the axle

of the double eccentric described in my prior specification above referred to. By this arrangement additional automatic adjustment of the leverage may be obtained responsive to variations in the load.

It will be understood that I do not wish to confine myself to the construction and arrangement above referred as many modifications coming within the spirit of the invention may be made.

Dated this 17th day of February, 1921.

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Agents for the Applicant.

### COMPLETE SPECIFICATION.

#### Improvements in or relating to Suspension Devices for Motor and other Vehicles.

I, ANTOINE MUTTI, of Portsmouth Road, Cobham, in the County of Surrey, a citizen of the Republic of Switzerland, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to suspension devices for motor and other vehicles of the kind in which the wheels are connected with the chassis or body of the vehicle through the medium of pivoted members or devices which are adapted to act upon suitably disposed springs or other resilient devices, the arrangement being such that the action of the resilient devices is magnified whilst means are provided for altering the leverage at which the said devices act.

In the Specification of my prior Patent No. 13,448 of 1913 means are described whereby the alteration of leverage may be obtained automatically in accordance with variations in the load, the said automatic adjustment becoming effective as a result of the passage of the vehicle over inequalities in the road surface.

The present invention comprises an improvement in or modification of the invention set forth in my said prior Specification No. 13,448 of 1913 and has for its object to provide means whereby the adjustment may be obtained automatically upon variation of the load with-

out relying upon inequalities in the road for bringing the leverage adjusting mechanism into action.

With this object in view in accordance with the invention I provide means whereby the rotation of the running wheels of the vehicle is utilised to bring into action the leverage adjusting mechanism upon variation in the load.

For the sake of convenience the invention will be described in its application to the constructional form of the apparatus described with reference to Figure 6 of my prior specification above referred to although it will be understood that I do not desire to limit myself to this application of the invention as it is applicable to the other constructional forms described in the said prior specification.

In this application of the invention the oscillating movements of the lever due to variations of the load are utilised to bring a small rotatable wheel into contact with the hub or brake drum of one of the running wheels of the vehicle and at the same time to bring one or other of a pair of rotatable discs, located on opposite sides of the said small wheel, into contact with the periphery thereof, the rotation of the discs being utilised to vary the position of the leverage adjusting sleeve on the said lever.

When the suspension device is employed upon vehicles in which the

variation of the load is greater than the vehicle weight, such as commercial vans and lorries, the rotation of the said discs is also preferably used to alter the leverage of the double eccentrics.

In order that the said invention may be clearly understood and readily carried into effect, the same will now be described more fully with reference to the accompanying drawings, in which:—

Figure 1 is an elevation illustrating the invention applied to the constructional form shown in Figure 6 of the principal Specification No. 13,448 of 1913.

Figure 2 is a section on the line A—A of Figure 1 and

Figure 3 is a part-sectional plan on the line B—B of Figure 2.

For the sake of convenience those parts forming part of the construction described in the principal specification will herein be given the same reference numerals.

The lever 52 which is pivoted at 51 to the body of the vehicle is at the other end pivoted to a pillar or standard 1 supported by a road wheel axle and the said lever 52 at the end adjacent the said pillar carries a plate 2 having two cam slots 3 and 4 formed therein. In the cam slot 3 is engaged the axle 5 of a small freely rotatable wheel 6 (which preferably is rubber tyred) the periphery of which is adjacent to but not normally in contact with the hub or brake drum 7 of the road wheel. The said axle 5 is carried by a bearer 8 which is pivoted at 9 to the pillar 1, the arrangement being such that upon variation in the load the movement of the lever 52 about its pivot will cause angular movement of the plate 2 and bring the periphery of the wheel 6 into contact with the hub or brake drum 7. Located one on either side of the wheel 6 are two discs 10 and 11 the common shaft 12 of which passes through the bearer 8. Fitting between a double collar 13 on the shaft 12 is one arm 14 of a bell crank lever the other arm 14' of which passes through the cam slot 4 of the plate 2 and is fulcrummed in a bearer 15 carried by the pillar 1. Consequently as the plate 2 moves as a result of variation in the load the wheel 6 will be brought into contact with the hub or brake drum 7 and the shaft 12 will be moved by the bell crank lever to the right or to the left, according to the direction of movement of the plate 2, to bring one or other of the discs 10 and 11 into contact with the periphery of the wheel 6. One end of the shaft 12 is connected by

a flexible shaft 16 with a worm screw 17 meshing with a worm wheel 18 rotatably mounted on the sleeve 56 and screwed to engage a screw thread on the lever 52 so that the rotation of the discs 10 and 11 results in movement of said sleeve on the lever 52 and consequently adjustment of the leverage is effected. When the suspension device is employed upon vehicles such as commercial vans and lorries the other end of the shaft 12 may be connected by the flexible shaft 19 with a worm screw 20 meshing with the worm wheel 21 carried by a nut 22 which is mounted upon a screw 23 slidable with a tube 24 which is pivoted at 25 to the vehicle body. One end of the said screw 23 is connected with a yoke 26 carrying the shaft 61 constituting the axle of the double eccentric 59, 60, referred to in the principal specification. With this arrangement upon variation in the load the position of the axle 61 of the double eccentric will be altered thus adjusting the leverage of the latter. If desired however instead of this latter adjustment being effected automatically by the means described it may be effected by hand, the worm screw 20 being carried by a flexible or other shaft adapted to be rotated by a hand wheel located at any convenient place.

It will be understood that I do not desire to confine myself to the exact construction and arrangement described and illustrated as many modifications thereof coming within the spirit of the invention may be made.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. The improvement in or modification of the invention set forth in the Specification of Patent No. 13,448 of 1913 consisting in the provision of means whereby the rotation of the running wheels of the vehicle is utilised for bringing into action the leverage adjusting mechanism upon variation in the load.

2. The improvement in or modification of the invention set forth in the Specification of Patent No. 13,448 of 1913, consisting in the provision of means whereby upon variation of the load the periphery of a small wheel is brought into contact with the hub or brake drum of one of the running wheels of the vehicle and simultaneously one of a pair of rotatable discs is brought into contact with the periphery of the said small wheel so as to be rotated

thereby, the rotation of the said discs being utilised to bring into effect the leverage adjusting mechanism.

3. A suspension device in accordance  
5 with the fifth claim of my prior Specification No. 13,448 of 1913, having a plate carried by the pivotted lever and means whereby the movements of said plate consequent upon variations in the load are  
10 utilised to bring into operation mechanism by which power derived from the rotation of the running wheels of the vehicle is transmitted to the sleeve carried by the said lever and effects adjustment  
15 of the leverage of the latter, substantially as described.

4. A suspension device in accordance with Claim 3, wherein the power derived from the rotation of the running wheels

of the vehicle is also utilised for varying 20 the leverage of the double eccentric, substantially as and for the purpose specified.

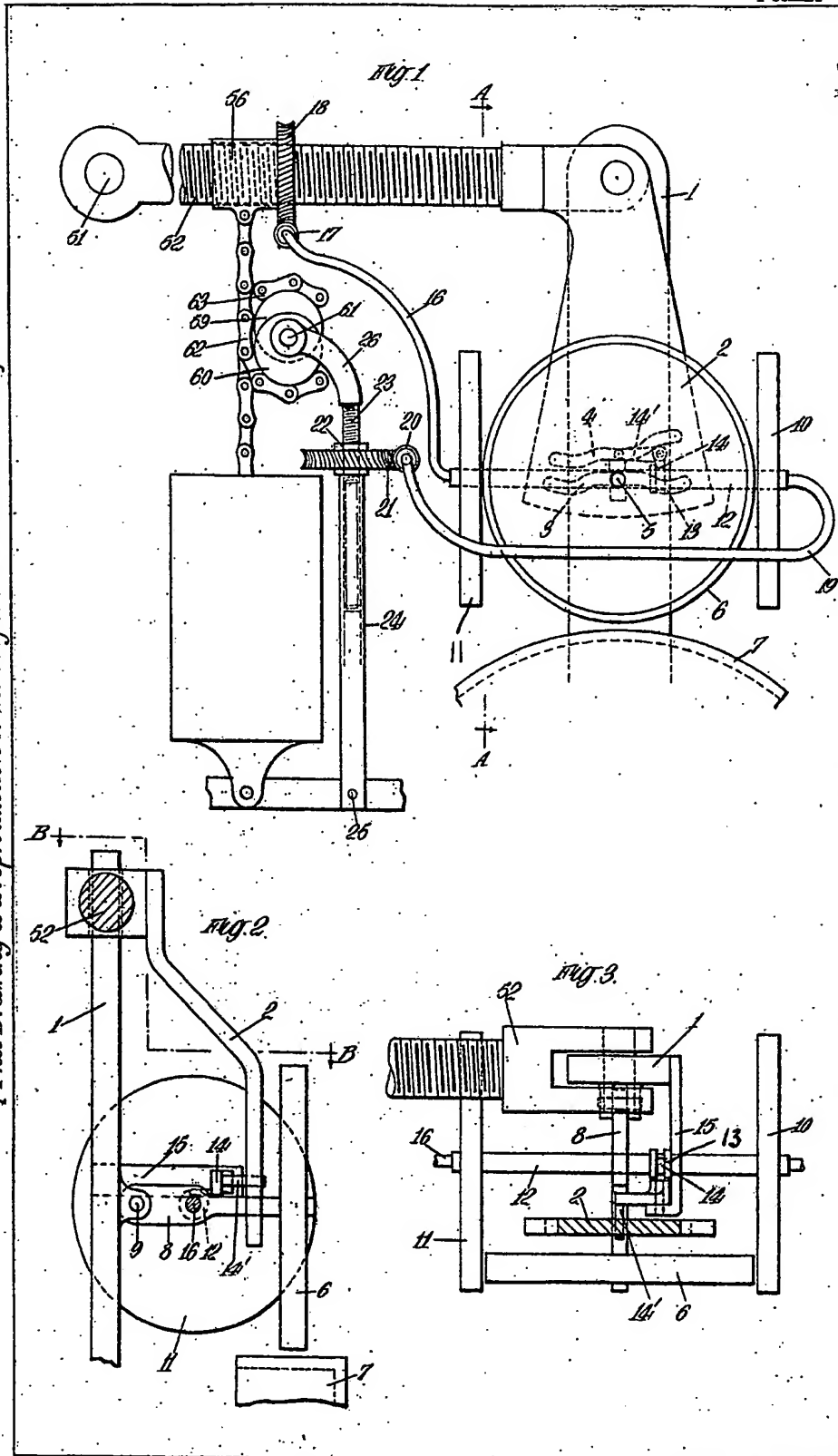
5. A suspension device of the kind referred to for motor and other vehicles, 25 having its parts constructed, arranged and adapted to operate substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 11th day of November, 1921. 30

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Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1922.

[This Drawing is a reproduction of the Original on a reduced scale]



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